Unit IX – Problem 1 – Clinical: Physical Fitness for Heart Patients

- **What are the levels of disease prevention?**
  - **Primordial prevention (أساسي):** measures which inhibit the development of environmental, social, economical and cultural patterns of living that are known to increase the risk of a disease.
  - **Primary prevention**: measures which prevent the occurrence of a disease by controlling its risk factors.
  - **Secondary prevention**: measures which are taken for early detection (e.g. screening programs) and immediate intervention to control the disease and minimize disabilities/ complications.
  - **Tertiary prevention (rehabilitation):** measures which aim to soften the impact of long-term disease and disability thus minimizing the suffering and maximizing potential years of useful life.
- **Cardiac rehabilitation program (CRP):**
  - **Definition**: it is a medically supervised program created by WHO (World Health Organization) to help heart patients to recover quickly and improve their overall physical, mental and social functioning.
  - **Goal of CRP**: slow/ reverse progression of cardiovascular diseases by reducing the risk of:
    - ✓ Severe heart disease.
    - ✓ Another cardiac event.
    - ✓ Death.
  - **What does it include?**
    - ✓ Counseling: which allows the patient to understand the disease he is suffering.
    - ✓ Beginning of an exercise program which is usually tailored (مُصَمَّم) to each patient's need. Exercise may be very structured (including ECG monitoring) or less structured (with infrequent monitoring).
    - ✓ Counseling on nutrition.
    - ✓ Helping the patient to modify risk factors such as hypertension, hyperlipidemia, smoking, diabetes, physical inactivity and obesity.
    - ✓ Enabling the patient to return to work.
    - ✓ Supplying information on physical limitations.
    - ✓ Providing emotional support.
    - ✓ Counseling on appropriate use of prescribed medications.
  - **For which patients the CRP is helpful?**
    - ✓ Angina pectoris.
    - ✓ Recent heart attack.
    - ✓ Patients with implanted pacemakers.
    - ✓ Heart transplant recipients.
    - ✓ Patients with chronic stable heart failure.
    - ✓ Patients with peripheral arterial disease and claudication.
    - ✓ Patients who had coronary artery bypass grafting surgery or balloon angioplasty.
  - **How to achieve optimal results with CRP?** → comprehensive CRP must be started immediately after the acute event and there are two reasons for that:
    - ✓ The willingness of substantial lifestyle changes is greatest after the psychological trauma of a potentially life-threatening cardiac event.
    - ✓ Early mobilization help to avoid the deconditioning (عدم التأقلم) associated with prolonged bed rest.
  - **There are five goals of comprehensive CRP:**
    - ✓ Induction of lifestyle changes.
    - ✓ Psychological adaptation to the chronic heart disease.
    - ✓ Patient education about CVD.

- ✓ Optimized medical therapy (العلاج الطبي الأمثل)
- ✓ Determination of exercise capacity.

- **CRP programs are instructed in three phases:**

Phase (1) – acute phase (inpatient)	Aims: lifestyle changes, start exercise program with determination of exercise capacity.
Phase (2) – reconditioning phase (outpatient, supervised)	Aims: continue of lifestyle changes, exercise program 3-5 times/wk for 15-50 min under medical supervision with improvement of exercise capacity.
Phase (3) – maintenance phase (outpatient, unsupervised)	Aims: confirming long-term lifestyle changes, exercise program 3-5 times/wk for 15-50 min without medical supervision

- **CRP staff includes:**
  - ✓ A cardiologist.
  - ✓ A physiotherapist.
  - ✓ A dietician.
  - ✓ Psychologist.
  - ✓ ± social worker.

- **General indications for the use of exercise testing in cardiovascular medicine:**
  - **Diagnosis of coronary artery disease (CAD).**
  - **Evaluation of a recent new diagnosis of CAD.**
  - **Differentiation of cardiac vs. pulmonary causes of exercise-induced dyspnea and/or impaired exercise capacity.**
  - **Prognostic stratification of patients with:**
    - ✓ Suspected or known CAD.
    - ✓ Recent acute myocardial infarction (MI).
    - ✓ Congestive heart failure (CHF).
  - **Functional evaluation and exercise prescription of patients with:**
    - ✓ Suspected or known CAD.
    - ✓ Recent acute myocardial infarction (MI).
    - ✓ Congestive heart failure (CHF).
  - **Evaluation of heart rhythm disorders in patients with:**
    - ✓ Rate-responsive pacemakers.
    - ✓ Known/ suspected exercise-induced arrhythmias.
  - **Evaluation of therapy efficacy in patients with:**
    - ✓ Suspected or known CAD.
    - ✓ Recent acute myocardial infarction (MI).
    - ✓ Congestive heart failure (CHF).

- **Stress test usually involves:**
  - **Exercise** (contraindications for doing exercise include: acute pericarditis, unstable angina, uncontrolled resting blood pressure > 200/100, severe aortic stenosis, recent pulmonary embolism and uncontrolled diabetes > 300 mg/dl):
    - ✓ Walking on a treadmill:
      - ❖ *The following must be monitored during this test:*
        - ➢ ECG
        - ➢ Blood pressure.
        - ➢ Heart rate.
        - ➢ Symptoms.
        - ➢ Time.
      - ❖ *When do you terminate the test? → when there is evidence of:*
        - ➢ Fatigue and dizziness.
        - ➢ Chest discomfort/ angina.

- Severe shortness of breath.
- Development of ventricular tachyarrhythmia.
- ST-segment depression.
- A fall in systolic blood pressure exceeding 10 mmHg.
- Target heart rate is achieved. Example: what is the target heart rate of a 30 years old man?
  - First, you must calculate the maximum heart rate = 220-age → 220-30 = 190
  - Then you can calculate the target heart rate by multiplying maximum heart rate by intensity (65%-85%) → 190 x 0.65 = 123… 190 x 0.85 = 161… so the target heart rate during exercise should be between 123-161 beats/minute.

✓ Riding a stationary bike.

- **Pharmacological stimulation (e.g. dobutamine and adenosine).**